

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-31. (cancelled).

32. (previously presented) A method of forming a metal part comprising:

(a) pouring molten metal into a mold formed of starting materials comprising foundry sand, binder, and a disintegration additive consisting essentially of an ionic compound;

(b) cooling said molten metal to form a solid;

(c) physically separating said solid from said mold to expose a surface of a metal part having residual mold material remaining thereon; and

(d) removing said residual mold material from said surface via electrolytic processing by applying a voltage and contacting said material with an electrolyte, wherein said disintegration additive promotes disintegration of said residual mold material during said electrolytic processing.

33. (previously presented) A method of forming a metal part according to Claim 32, wherein said electrolytic processing of said removing step further comprises:

(i) attaching the metal part to a power source having a first and a second electrode of opposite polarities, wherein said first electrode is attached to the metal part;

(ii) contacting the metal part and said residual mold material with said electrolyte, wherein said electrolyte is in contact with said second electrode; and

(iii) generating current through said electrolyte, from said first electrode to said second electrode.

34. (original) A method of forming a metal part according to Claim 33, wherein said electrolyte comprises a salt selected from the group consisting of: sodium carbonate, sodium bicarbonate, disodium phosphate, and mixtures thereof.

35. (original) A method of forming a metal part according to Claim 34, wherein said salt is sodium carbonate.

36. (original) A method of forming a metal part according to Claim 33, wherein said first electrode is a cathode.

37. (original) A method of forming a metal part according to Claim 33, wherein said contacting is by immersing said metal part in a reservoir of said electrolyte.

38. (original) A method of forming a metal part according to Claim 33, wherein said contacting is by spraying said electrolyte on a surface of said metal part.

39. (original) A method of forming a metal part according to Claim 32, wherein said metal part is an automotive drive train part.

40. (original) A method of forming a metal part according to Claim 33, wherein said disintegration additive enhances electron/ion conduction when said casting material is contacted with said electrolyte.

41. (cancelled).

42. (original) A method of forming a metal part according to Claim 32, wherein said disintegration additive volatilizes during the process of making said cast.

43. (original) A method of forming a metal part according to Claim 32, wherein said disintegration additive is a salt.

44. (original) A method of forming a metal part according to Claim 43, wherein the disintegration additive is selected from the group consisting of: sodium carbonate, sodium chloride, sodium hydroxide, sodium iodide, sodium nitrate, sodium phosphate, sodium sulfate, potassium carbonate, potassium chloride, potassium hydroxide, potassium iodide, potassium nitrate, potassium phosphate, potassium sulfate, calcium carbonate, calcium chloride, calcium hydroxide, calcium iodide, calcium nitrate, calcium sulfate, ammonium sulfate, ammonium carbonate, magnesium carbonate, magnesium chloride, magnesium hydroxide, magnesium iodide, magnesium nitrate, magnesium phosphate, magnesium sulfate, and mixtures thereof.

45. (original) A method of forming a metal part according to Claim 32, wherein said binder comprises a material selected from the group consisting of phenolic urethane resin, clay, and mixtures thereof.

46. (previously presented) A method of removing residual casting material from a metal part, the method comprising the steps of:

(a) attaching the metal part having residual casting material to a power source having a first and a second electrode of opposite polarities, wherein said first electrode is attached to the metal part;

(b) contacting said metal part with an electrolyte, wherein said electrolyte is in contact with said second electrode; and

(c) generating current through said electrolyte, from said first electrode to said second electrode; wherein said residual casting material is made from a mixture comprising casting sand, binder and a disintegration additive consisting essentially of an ionic compound that promotes disintegration of said residual casting material during electrolytic processing in the presence of an applied voltage and an electrolyte to promote disintegration of said residual casting material.

47. (original) A method of removing residual casting material according to Claim 46, wherein said contacting is by immersing said metal part in a reservoir of said electrolyte.

48. (original) A method of removing residual casting material according to Claim 46, wherein said contacting is by spraying said electrolyte on a surface of said metal part.

49. (original) A method of removing residual casting material according to Claim 46, wherein said electrolyte comprises a salt selected from the group consisting of: sodium carbonate, sodium bicarbonate, disodium phosphate, and mixtures thereof.

50. (original) A method of removing residual casting material according to Claim 49, wherein said salt is sodium carbonate.

51. (original) A method of removing residual casting material according to Claim 46, wherein said first electrode is a cathode.

52. (original) A method of removing residual casting material according to Claim 46, wherein said metal part is an automotive drive train part.

53. (original) A method of removing residual casting material according to Claim 46, wherein said disintegration additive enhances electron/ion conduction when said casting material is contacted with said electrolyte.

54. (original) A method of removing residual casting material according to Claim 46, wherein said disintegration additive promotes disintegration of said cast material during said removing step.

55. (original) A method of removing residual casting material according to Claim 46, wherein said disintegration additive volatilizes during the process of making said cast.

56. (original) A method of removing residual casting material according to Claim 46, wherein said disintegration additive is a salt.

57. (original) A method of removing residual casting material according to Claim 56, wherein the disintegration additive is selected from the group consisting of: sodium carbonate, sodium chloride, sodium hydroxide, sodium iodide, sodium nitrate, sodium phosphate, sodium sulfate, potassium carbonate, potassium chloride, potassium hydroxide, potassium iodide, potassium nitrate, potassium phosphate, potassium sulfate, calcium carbonate, calcium chloride, calcium hydroxide, calcium iodide, calcium nitrate, calcium sulfate, ammonium sulfate, ammonium carbonate, magnesium carbonate, magnesium chloride, magnesium hydroxide, magnesium iodide, magnesium nitrate, magnesium phosphate, magnesium sulfate, and mixtures thereof.

58. (original) A method of removing residual casting material according to Claim 46, wherein said foundry sand comprises a material selected from the group consisting of synthetic sand, bank sand, silica sand, and mixtures thereof.

59. (original) A method of removing residual casting material according to Claim 46, wherein said binder comprises a material selected from the group consisting of phenolic urethane resin, clay, and mixtures thereof.